
BAROSSA PWRA

FRACTURED ROCK AQUIFER

Groundwater Level and Salinity Status Report

2012



Government of South Australia
Department of Environment,
Water and Natural Resources

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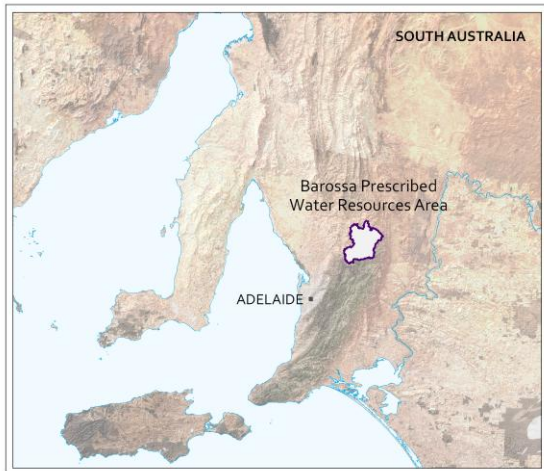
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2012 SUMMARY



The Barossa Prescribed Water Resources Area (PWRA) encompasses both the highland areas of the Mount Lofty Ranges and the Barossa Valley, approximately 60 km north-east of Adelaide. It is a regional scale resource for which surface water and groundwater have been prescribed under South Australia's *Natural Resources Management Act 2004*. A Water Allocation Plan provides for sustainable management of the groundwater resources.

Barossa PWRA consists of three major aquifers; two sedimentary aquifers (Upper and Lower), which are located within the valley and a Fractured Rock Aquifer which outcrops in the ranges to the east and west of the valley and underlies the sedimentary aquifers. This report focuses on the Fractured Rock Aquifer (FRA) of the Barossa PWRA.

Groundwater flow within the FRA generally follows the topography and flows from high points in the catchments to low points where groundwater discharges to streams. Groundwater moves westward from the ranges with some discharge to the sedimentary aquifers. Beneath the valley, the flow direction turns southwest. The salinity of the aquifer varies from 450 to over 5000 mg/L, with the more saline wells in the south-west of the Barossa PWRA.

The FRA is the main source of extraction in the Barossa PWRA, with 65% of groundwater extracted in the area from this aquifer during 2012, which is generally used for the irrigation of vineyards. Metered extractions from the FRA totalled 1328 ML* for 2011-12, a 42% increase from the previous water-use year (Fig. 1). This volume of extraction equates to 18.5% of the total allocation limit of 7147 ML for the Barossa PWRA.

The climate of the Barossa PWRA is characterised as Mediterranean with hot dry, dry summers and cool, wet winters. Data from the Angaston rainfall station (number 23300) were chosen for analysis of rainfall in 2012 (Fig. 2). The long-term monthly average rainfall is graphed in orange against the total monthly rainfall recorded. In 2012, the monthly rainfall data indicates that significantly above average rainfall occurred in January and March, however well below average rainfall was evident from July through December. The total annual rainfall was 370 mm, significantly below the long-term (1889-2012) annual average of 535 mm.

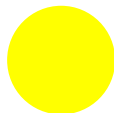
Due to the significantly below average rainfall and increased groundwater extractions, water levels in the Fractured Rock Aquifer have declined in 90% of observation wells by up to 2.13 m when compared with the maximum water level observed in 2011 (Fig. 3). Despite the general regional decline in water level, four wells observed an increase in water level of up to 2.95 m when compared with 2011. The decline is likely due to the significantly below average rainfall observed from July through December which has diminished water level recovery.

Groundwater salinity in the FRA is highly variable due to the complex system of preferential flow paths affecting recharge and movement through the aquifer. Long-term salinity trends indicate that well MOR 246 has experienced a significant rise (3699 mg/L) in salinity over the past 10 years whilst well MOR 233 has shown little variability except during the drought period when decreased recharge is likely to have caused a peak in salinity. In October 2012 four wells were monitored for salinity which ranged from 383 to 6131 mg/L (Fig. 4), with three wells having a salinity value higher than 1500 mg/L, the tolerance level for grape vines. Three of the four observation wells show an increase in salinity when compared to October 2011 salinity values.

** The licensed groundwater use for the 2011-12 water-use year is based on the best data available as of March 2013 and may be subject to change, as some extraction volumes are in the process of being verified.*

The Fractured Rock Aquifer of the Barossa PWRA has been assigned a yellow status for 2012:

2012 STATUS



“Gradual adverse trends, indicating a low risk to the resource in the medium term”

This means that gradual adverse trends in resource status have been observed over the reporting period. Continuation of these trends is unlikely to negatively impact the beneficial use (may include drinking water, irrigation or stock watering) of the resource for at least 15 years. The 2012 status for Fractured Rock Aquifer is supported by:

- an overall decrease in the maximum recovered water level in 90% of observation wells when compared to 2011 water level data
- salinity in three of four wells monitored was higher than that recorded at the same time in 2011, and three of four wells monitored recording salinities higher than 1500 mg/L which is the tolerance level for grape vines

To view the *Barossa PWRA Groundwater Level and Salinity Status Report 2011* which includes background information on hydrogeology, location of rainfall stations and relevant groundwater dependent ecosystems, [visit WaterConnect](#).

To view descriptions of all status symbols, [click here](#).

For further details about the Barossa PWRA please see the [Water Allocation Plan for the Barossa Prescribed Water Resources Area](#)

Barossa PWRA: Fractured Rock aquifer annual groundwater extraction

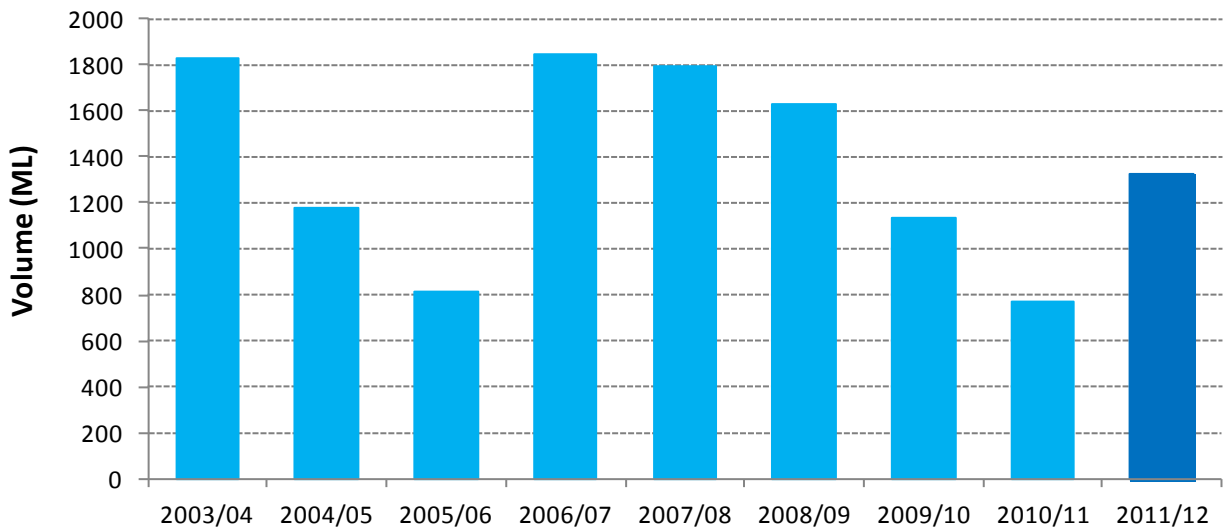


Figure 1. Historical licensed groundwater use for the Fractured Rock Aquifer in the Barossa Prescribed Water Resources Area

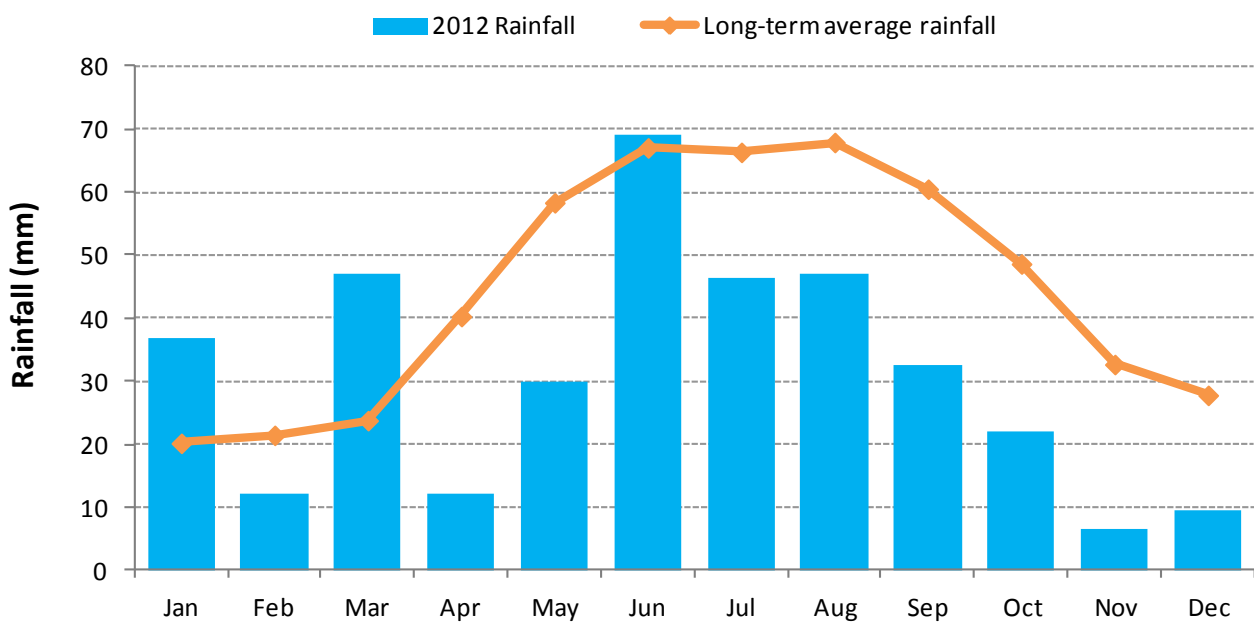


Figure 2. Monthly rainfall (mm) for 2012 and the long-term average monthly rainfall (mm) at the Angaston rainfall station (number 23300) in the Barossa Prescribed Water Resources Area

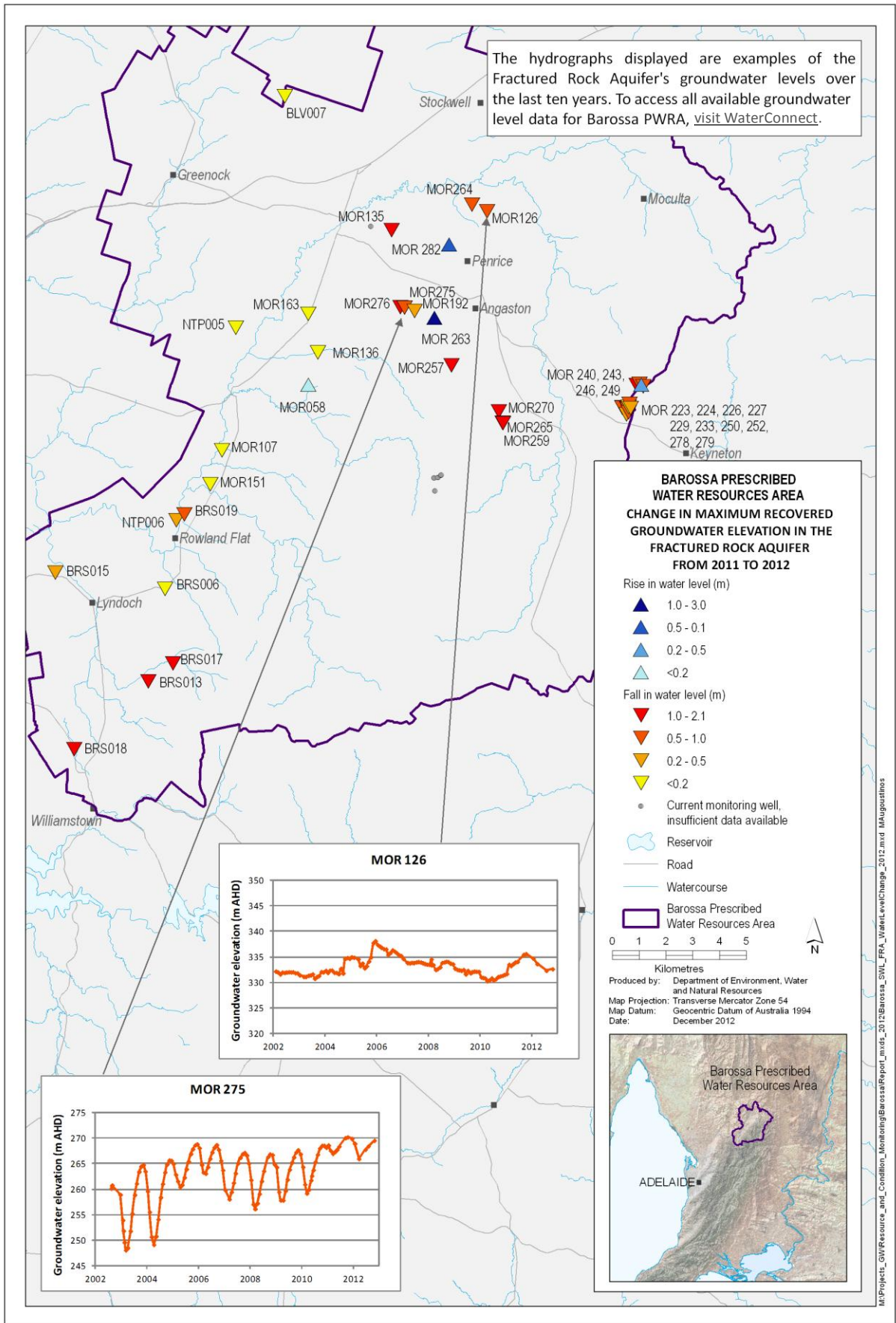


Figure 3. Overall changes in maximum groundwater levels in the Fractured Rock Aquifer of the Barossa Prescribed Water Resources Area from 2011 to 2012

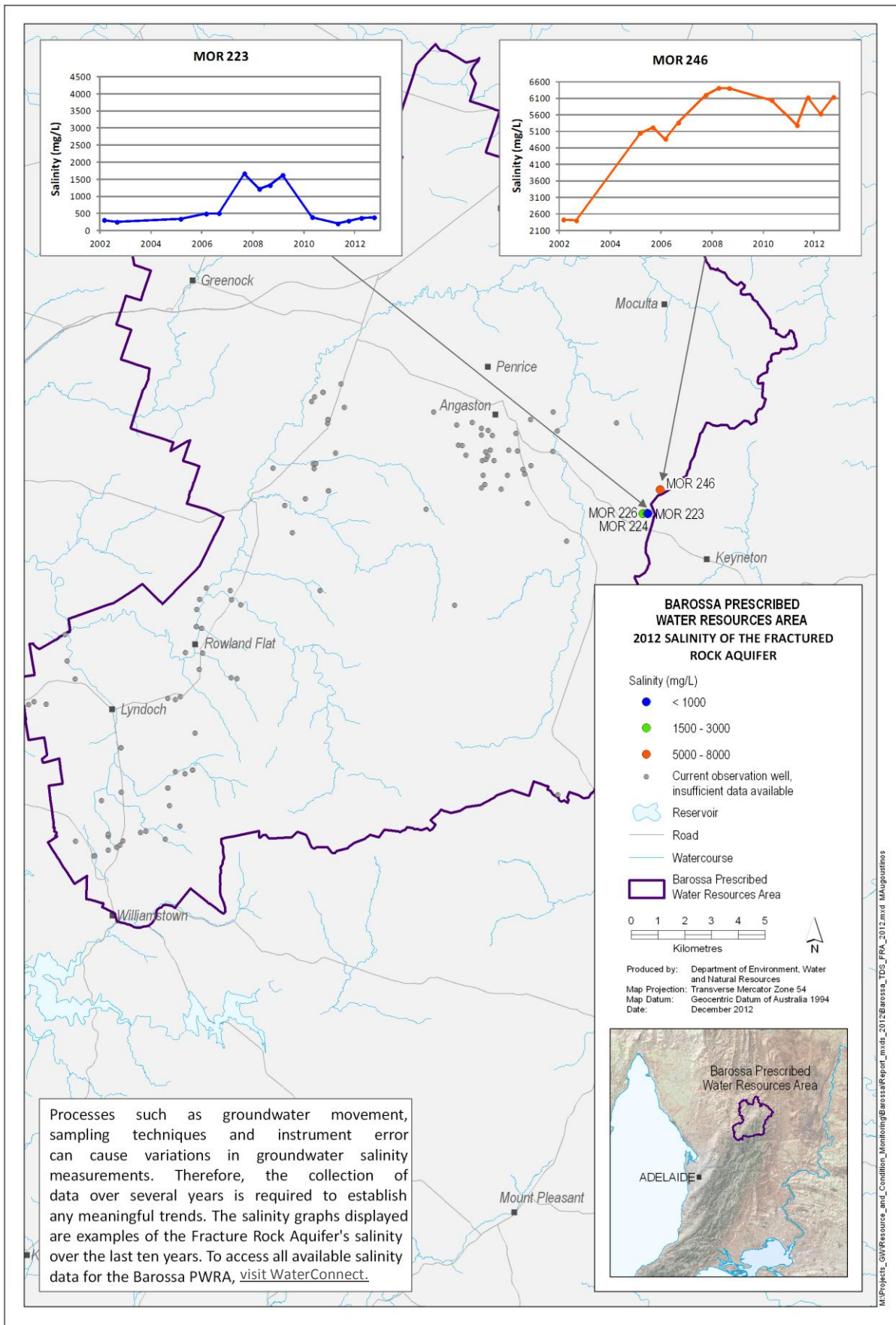


Figure 4. Groundwater salinity of the Fractured Rock Aquifer in the Barossa Prescribed Water Resources Area for October 2012

Barossa PWR

Fractured Rock aquifer Groundwater Status Report 2012

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